

Health Equity & Community Engagement

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Parenting stress predicts fast food intake in an urban community sample of overweight parents of toddlers*

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ABSTRACT IMPACT: The findings suggest that targeting parenting stress in combination with psychoeducation on nutrition and physical activity may have positive effects in improving healthy food choices such as reduction of fast food intake, which may in turn impact the health of toddlers and their families. **OBJECTIVES/GOALS:** Parent stress is associated with a myriad of unhealthy behaviors including overeating, decreased physical activity, which contribute to increased weight. Several programs have aimed to increase education of nutrition, but few have focused on parent stress to improve healthy food intake. The present study assessed parent stress and fast food intake. **METHODS/STUDY POPULATION:** Parents who have obesity and had a toddler in the age group of 2-5 years were enrolled for a preventive intervention study to assess the effect of a parent-based intervention to improve family health choices and reduce childhood obesity risk. The sample included 105 participants, mean age 34.80 (6.27) years old, mean body mass index (BMI) 35.51 kg/m², 39.0% Non-Hispanic White, 20.0% Non-Hispanic Black, 22.9% multiracial, 12.4% Hispanic, and 5.7% other. Stress was assessed using the Perceived Stress Scale (PSS) to assess overall general stress and the Parenting Stress Index (PSI) to assess parent-specific stress. Chaos in the home and fast food intake were also assessed using self-report surveys. **RESULTS/ANTICIPATED RESULTS:** Preliminary results are based on available data as of October 2020, data collection and recruitment are still in progress. There was a significant correlation between fast food intake with PSS ($r=.18$, $p=.04$), chaos ($r=.24$, $p=.02$), and PSI ($r=.25$, $p=.01$). Using a hierarchical regression model, we entered home chaos in the first block which explained a significant amount of the variability ($R^2=.06$, $p=.04$). PSS was entered in the second block, which was not significant (R^2 change $=.01$, $p=.50$), and in the final block PSI was entered and was significant (R^2 change $=.13$, $p<.01$). **DISCUSSION/SIGNIFICANCE OF FINDINGS:** The data indicate that parenting stress uniquely predicts fast food intake above and beyond what could be explained by home chaos and general perceived stress. Future analyses will assess a parent-based intervention targeting stress reduction to improve weight and health for the parent and their toddlers in order to reduce childhood obesity risk.

Mechanistic Basic to Clinical

25487

Timing and strength of hand grasp that are affected by abnormal coupling between arm muscles following stroke: A pilot study

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ABSTRACT IMPACT: Impaired neuromuscular control could lead to the failure in activation and deactivation of the target muscles in a

timely manner, with the concurrence of activities of non-targeted muscles. **OBJECTIVES/GOALS:** Stroke leads to impaired capacity to manipulate objects with the hand in terms of timing and strength of grasp. The influence of abnormal coupling across more proximal arm muscles post stroke on the failure in normal functioning of finger flexor muscle activity is of interest to investigate. **METHODS/STUDY POPULATION:** We have recruited 12 participants with stroke hemiparesis in the sub-acute or chronic stage. Motor impairment of the arm was assessed using electromyography (EMG) and the Fugl-Meyer Upper Extremity (FMUE) assessment. Participants were requested to flex and relax the metacarpophalangeal (MCP) joints against motorized resistance in response to audible tones to determine timing and strength during flexion. They were asked to flex maximally, as quickly as possible, in response to the first of a pair of tones, and relax as quickly as possible after the second tone. Delays in initiation and termination were evaluated using EMG responses versus a predefined threshold. **RESULTS/ANTICIPATED RESULTS:** We anticipate greater delays in grasp initiation as well as in grasp termination in participants with a greater extent of abnormal coupling across more proximal muscles of the upper extremity in comparison to participants with a less extent, using the results of the FMUE assessment. Also it is expected that participants with a greater extent of the flexion synergy produce a less extent of force generation. The EMG results will show that activities of more proximal arm muscles precede the initiation of MCP flexion and their activity termination precedes that of MCP flexion, significantly more in participants with a greater extent of the flexion synergy. **DISCUSSION/SIGNIFICANCE OF FINDINGS:** The flexion synergy over the arm following stroke affects the timing and strength of hand grasp. Impaired neuromuscular control could lead to the failure in activation and deactivation of the target muscles in a timely manner, with the concurrence of activities of non-targeted muscles.

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Impact of fundus pigmentation on retinal layer visibility on investigational bedside optical coherence tomography in preterm infants

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ABSTRACT IMPACT: This study helps translate investigational bedside optical coherence tomography into improved diagnosis and care of preterm infants at risk for retinopathy of prematurity. **OBJECTIVES/GOALS:** In retinopathy of prematurity screening, fundus photography may be of limited quality in eyes with dark fundus pigmentation (FP). The goal of this study was to evaluate the impact of FP on overall scan quality and retinal layer visibility on investigational bedside optical coherence tomography (OCT) in preterm infants. **METHODS/STUDY POPULATION:** We analyzed 846 OCT scans captured prospectively from 188 eyes of 94 preterm infants enrolled in the BabySTEPS study (NCT02887157). Trained ophthalmologists, masked to OCT findings, determined FP (blond, medium, or dark). Expert graders, masked to FP, evaluated OCT images for: 1) overall OCT quality (excellent, acceptable, poor, or unusable); and 2) all age-appropriate retinal layers visible (yes or no). To assess the association of FP with OCT quality (excellent/acceptable or poor/unusable) and retinal layer visibility, we performed multivariable logistic regression modeling, adjusting for

biologic and demographic confounders and correlations from repeated OCT scans and paired eyes. RESULTS/ANTICIPATED RESULTS: Mean birthweight was 964 (SD=283) grams, mean gestational age was 27.8 (SD=2.6) weeks, 48 (51%) infants were male, and 51 (54%) were non-white. On exam, 72 (38%) eyes had blond FP, 92 (49%) had medium, and 24 (13%) had dark. OCT quality was excellent or acceptable in 725 scans (86%) and all age-appropriate retinal layers were visible in 781 scans (92%). Compared to eyes with blond FP, eyes with medium and dark FP did not have higher odds of poor/unusable OCT scan quality (adjusted OR 0.87 [95% CI 0.50-1.48] and 0.49 [95% CI 0.16-1.55], respectively) or not all age-appropriate retinal layers visible on OCT (adjusted OR 1.17 [95% CI 0.39-3.51] and 0.57 [95% CI 0.15-2.20], respectively). DISCUSSION/SIGNIFICANCE OF FINDINGS: Medium and dark FP did not impact overall scan quality or age-appropriate retinal layer visibility on investigational bedside OCT in preterm infants. This study supports the feasibility of using OCT to analyze retinal microanatomy in diverse populations of preterm infants with a range of FP.

75200

Fecal Microbiota Transplantation to Prevent Infections in Patients with Acute Myeloid Leukemia: A Double-Blind Randomized Placebo-Controlled Phase 2 Clinical Trial

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ABSTRACT IMPACT: By restoring the gut microbiota in patients with acute myeloid leukemia exposed to antibiotics, we will reduce infections during and after curative-intent chemotherapy. OBJECTIVES/GOALS: Infection is a leading cause of death in acute myeloid leukemia (AML). Antibiotics disrupt the gut microbiota, promoting secondary infections. Through a double-blind randomized placebo-controlled phase 2 trial, we will determine whether microbiota restoration using fecal microbiota transplantation (FMT) prevents infections in AML patients. METHODS/STUDY POPULATION: 72 intensively treated AML patients at our institution are randomized in a 2:1 ratio to FMT (arm A) or placebo (arm B). After completing each course of antibacterial antibiotics, patients receive one study treatment. Up to 3 study treatments are administered over 3 months. FMT is delivered as a third-party oral product containing microbiota (~5x10¹¹ bacteria) in 4-6 capsules. Stool samples are collected before and after each study treatment. The primary endpoint is 4-month overall infection rate. 16S rRNA gene sequencing of stool samples is used to determine specific taxa that are under- or over-represented in samples preceding infections and compare the two arms for key microbiome features including diversity and composition. Bloodstream infection within 7 days after FMT counts towards stopping rule. RESULTS/ANTICIPATED RESULTS: Five patients have been enrolled: 4 have received 1 dose and 1 received 2 doses. The only adverse event (possibly related to study treatment) has been grade 1 abdominal pain in 1 patient. Notably, no bloodstream infection has occurred. All planned samples have been collected and are sequenced in batches. We expect arm A patients to experience fewer infections and fewer intestinal blooms of pathobionts, and both arms to experience intestinal blooms before specific infections. An interim efficacy analysis will be performed at half total enrollment. DISCUSSION/SIGNIFICANCE OF FINDINGS: Current supportive

care during intensive chemotherapy is fundamentally anti-microbial and results in dysbiosis, with detrimental consequences. We will establish the evidence for FMT as a restorative strategy in AML patients. This is the first randomized placebo-controlled trial of repeated FMT, with potential implications to other cancers.

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Effect of conjugated estrogens and bazedoxifene on glucose, energy and lipid metabolism in obese postmenopausal women

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ABSTRACT IMPACT: A short treatment of 8 obese postmenopausal women with conjugated estrogens and bazedoxifene does not alter insulin sensitivity or ectopic fat but increases serum markers of hepatic de novo lipogenesis and production of triacylglycerides. OBJECTIVES/GOALS: Combining conjugated estrogens (CE) with the selective estrogen receptor modulator bazedoxifene (BZA) is a novel, orally-administered menopausal therapy. We investigated the effect of CE/BZA on insulin sensitivity, energy metabolism, and serum metabolome in postmenopausal women with obesity. METHODS/STUDY POPULATION: We conducted a randomized, double-blind, crossover pilot trial, testing the effect of CE/BZA on cardiometabolic health in postmenopausal women. Eight postmenopausal women (age 50-60 y, BMI 30-40 kg/m²) were randomized to an 8-week CE/BZA or placebo treatment separated by an 8-week washout period [NCT02274571]. The primary outcome was insulin sensitivity (hyperinsulinemic-euglycemic clamp), while secondary outcomes included body composition (DXA); resting metabolic rate (RMR); substrate oxidation (indirect calorimetry); ectopic lipids (1H-MRS); fat cell size, adipose and skeletal muscle gene expression (biopsies); inflammatory markers; and serum metabolome (LC/MS). RESULTS/ANTICIPATED RESULTS: CE/BZA had no effect on insulin sensitivity, body composition, ectopic fat, or substrate oxidation, but resulted in a non-significant increase in RMR (basal: p=0.06; high-dose clamp: p=0.08) compared to placebo. CE/BZA increased serum high-density lipoprotein cholesterol. CE/BZA also increased serum diacylglycerol (DAG) and triacylglycerol (TAG) species containing long-chain saturated, mono- and polyunsaturated fatty acids (FAs), and decreased long-chain acylcarnitines. These findings possibly reflect increased hepatic de novo FA synthesis and esterification into TAGs, and decreased FA oxidation, respectively (p<0.05). CE/BZA increased serum phosphatidylcholines, phosphatidylethanolamines, ceramides, and sphingomyelins, possibly reflecting the increase in lipoproteins (p<0.05). DISCUSSION/SIGNIFICANCE OF FINDINGS: A short treatment of postmenopausal women with CE/BZA did not alter insulin action or ectopic fat, but increased markers of hepatic de novo lipogenesis and TAG production. Study limitations include a small sample size and short treatment period. A larger, fully powered study is needed to validate the potential metabolic benefit of combining CE with BZA.